

COOP'S TECHNOLOGY DIGEST

-A Timely Report On The World Of Communications-

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REACHING CTD: Telephone (64) (0)9-406-0651; 24 HOUR FAX (64) (0)9-406-1083
NEXT ISSUE DATE: JULY 1, 1998

COOP'S TECHNOLOGY DIGEST / SUBSCRIPTION INFO

There are ten (10) issues per year on a schedule dictated by industry events. The readership includes telecommunication industry consultants, broadcasters/telecasters, brown goods importers, retail stockists, installation and maintenance firm personnel, educators, regulatory agencies, business investors and Arthur C. Clarke. All copies sent via airmail / Fast Post. Annual subscription NZ\$250 per year within New Zealand, US\$250 per year outside. In Australia, CTD is represented exclusively by AV-COMM Pty Ltd, PO Box 225, Balgowlah NSW 2093: Tel. (61) 2-9949-7417; Fax. (61) 2-9949-7095. Outside of Australia, make payment out and mail to:

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May 27, 1998 ♦ VOLUME 98-05-48

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DVD's Entrance into The Pacific

Cynics believe development of the digital video disc has been largely promoted by movie studios intent on recreating the original VHS market of two decades ago. Certainly the rental and sell-through markets for VHS tapes of popular movies have been major contributors to studio bottom line profits. It is no longer unusual for VHS tape rental and sale income for a movie to exceed the original "box office" revenue. The movie studios have never had it so good and they know it. The movie release has become the nearest thing to the "perpetual motion machine" the entertainment industry has ever known.

The key to this new found movie success is the television set. Until television penetrated virtually every home in the developed world, movies had to be seen in a theatre. Most homes do not have the flexibility to attend as many movies as they might wish; the television set is already in the home, and the challenge for movie makers is to design the least expensive, least home-life-challenging system of getting the movie to the TV set.

VHS tape was a natural. The TV set was in place, VHS players appeared in the marketplace and quickly declined in price under intense competitive pressures. By the mid 1980s most developed regions reported 50% or better VHS player penetration in TV set equipped homes (which, coincidentally, ran past 90% to 99%) (1). The scene was set for the rapid development of "corner video stores" and the movie studios shortly knew they had a sizeable, new market on their plate.

When movies only displayed at the local theatre, life was less complex for the movie moguls. A system of favourites and kickbacks quickly emerged; big name stars in major movies commanded theatre guarantees in advance of showing. Theatre chains grew as a booking device that suited the movie producer needs. Competitive chains bid against one another for major releases and the movie owners laughed - as they say - all the way to the bank.

Broadcast television signalled a change in how business was done. During television's initial decade of development, movie owners feared the home screen and denied TV broadcasters access to any but the very oldest, no longer theatre distributed movies. But this passed when Paramount and then Disney involved themselves in the TV broadcasting business and studios discovered they could keep their production facilities busy by producing "made for television" series and features. The wall between the studios and the home screens was breaking down because there was money in being a home screen participant. By the mid 60s, a time when television was just gaining an initial foothold in New Zealand and Australia, the movie studios were operating at near capacity because of TV productions. The movie business was not good - at that time - but TV was.

Through the late 60s and the first half of the 70s, a number of business proposals were created to place the movie people more directly into the television business. Sending movies to homes via cable television systems was trialled (Oklahoma, Ontario [Canada], California) and largely because the technology to control who would receive which movie, and how they would pay for the movie did not exist at the time, the trials were not enthusiastically reported. Upon reflection, the message from the movie industry - even in the 60s - should have been crystal clear.

1) In the first year of VHS player sales in America, 30,000 units were sold. In the seven months of DVD players, 220,000 units. Audio CD players took two years to pass 200,000 units sold. The number now believed sold or on display ready for sale has passed 500,000.

"Until you can show us a distribution system where the 'gate' is controlled and our revenue guaranteed, we are not interested."

From the movie industry perspective, cable television at that point in time "leaked like a sieve." Where in theory cable only served homes legally connected and paying for programme delivery, the reality was quite different. And the movie industry knew this. Cable theft was rampant and the closer cable moved into the major markets, the less secure the delivery system was proving to be. Indirectly, movie was telling cable - *"We like your concept; come back and see us when you have the details worked out."*

Product security, a paranoia in the movie industry, first surfaced at the opening of the century. Bootleg prints of silent films typically outnumbered official prints and movie houses on secondary, small town circuits were routinely supplied with copies which did not involve payment to the creators of the films. And that fear of losing control of their product has multiplied exponentially as technology has simplified the duplication and distribution of films. As VHS tape became an accepted technology, in a rare showing of common purpose Hollywood producers unanimously agreed to fund a major effort to secure world-wide legislation to protect their creative rights to films. A former aid to US President Lyndon B. Johnson was hired to head up the MPAA (Motion Picture Association of America) and in twenty years Jack Valenti has succeeded in changing the wording, content and penalties associated with intellectual property rights around the globe.

VHS tape was the proving ground for both the new copyright laws and the evolution of duplication technology. VHS tape has always carried within itself a technological limitation to successful unauthorised duplication. With each successive copy (of a copy of a copy) the quality of the product diminishes. It has been technically possible to build into VHS rental (or sale) copies two forms of degradation designed to inhibit further copies:

1) By limiting the signal to noise ratio of the original video store copy to the lower edge of "acceptable quality," further generation dubs of the tape quickly become poorer and poorer. The first generation "down" from the rental store copy is marginal, each succeeding generation is markedly poorer so that by the 3rd or 4th generation removed the quality is quite unacceptable.

This has had the effect of limiting (or slowing down, although not stopping) large scale unauthorised duplication of films.

2) By building into the tape a purposeful degradation which in theory only becomes apparent when someone attempts to make even a first generation "down" dub of the rental store tape. There are various technical schemes here; the most widely employed, by the movie studios, is known as Macrovision.

The concept here is that people should not commercially profit from "copy protected" tapes designed to prevent copying.

Alas, neither low signal to noise ratio nor copy protected tapes have proven to be a deterrent to a facility equipped with the proper technology to bypass the purposeful attempts to stop or limit further copying. The movie studios knew, going in, they were probably creating one unauthorised copy for every tape they received payment for and from the beginning of movies on VHS tape they have priced their products accordingly at twice the book rate. *"If each of our tapes is going to be illegally copied once, we simply charge twice as much for the original"* noted an executive of Disney more than a decade ago. VHS tape has been a security "hole" for movies; DVD - they planned - would not be.

Enter Digital

VHS tape is an analogue format, and within the physics of the technology and the way the techniques were applied was the opportunity to "control" but not stop duplication. Digital formats were going to be an entirely new challenge because gone from digital was any ability to limit

2/ "Trust" is not a part of the movie folk's vocabulary. Movie producers routinely station an agent outside of a theatre to "count" the patrons buying tickets as a check on the reported "gate" from the movie house. Theatre operators respond by creating falsified reports of ticket pricing categories building up the "count" for lower price tickets and reducing the other end.

DVD "Regions" As Mandated by Motion Picture Companies in USA

Region 1	Canada, United States, US territories
Region 2	Japan, Europe, South Africa, Middle East (including Egypt)
Region 3	Southeast Asia, East Asia (including Hong Kong)
Region 4	Australia, Central America, New Zealand (*), Pacific Islands, South America
Region 5	Africa, CIS (former Soviet Union), India, Mongolia, North Korea
Region 6	China

Motion picture studios have dictated the use of regional coding for DVD players and DVD movies. This is an attempt to control movie discs being played in a "region" prior to the movie being shown in theatres in the region, and prior to that movie being "officially" released in a region on disc. Discs in an unaltered player will not function if their own regional coding differs from that of the player (i.e., the two codes must "match"). This is not an encryption system; there is only a single bit of information which the player checks to ascertain the disc regional code. Discs without imbedded regional codes will play on any DVD player and non-theatrical releases have no region coding. PCs equipped with DVD-ROM capability are similarly region restricted. Windows 98 and MacOS have regional code checking built into the operating system. Some DVD-ROM packages allow the consumer to "change" the regional coding for a limited (specified) number of uses of the disc, effectively negating the regional system with a stroke of the keyboard.

* / There is some perhaps loose talk ongoing on Internet about Australia and New Zealand being moved to Region 2 and NZ stores are stocking Region 2 players from the UK and Japan.

copying. A digital copy could in theory have the same quality as a digital original (master). There would be no protection from "generation down-grading" built into the analogue VHS format.

Digital video disc (DVD) distribution was clearly a major worry to the movie folks. Some way - a high technology system - had to be found to ensure that someone purchasing a movie on DVD did not take it into the back room and run off several thousand "good as the original" copies. In the movie industry, where "gate counts" are a part of the day to day business routine (2), movies on DVD seemed like a major threat.

Illegal copies outside of the "house count" system were only a part of the challenge. The other was release dates. American movies are first released in North America. Advertising, free plugs on television news and entertainment shows, sneak preview newspaper reviews are orchestrated with all of the skill and planning ability of the movie distributors. But movies released in North America will not be released elsewhere for months, perhaps years. With CNN and other world circling information sources now available to all corners of the globe, viewers quickly learn about the latest America (only) releases - well in advance of their local release dates. The movie people see this as a problem. They told the DVD creators, "*We want you to regionalise the DVD players to prevent people from importing movies released on disc in America and viewing those movies before we (as in "WE - the movie distributors") are ready to release the film in India (Australia, Belgium, et al).*"

Regions of the world number 6, as the table here shows. The concept for this portion of the "DVD security system" is quite simplistic:

1) Each DVD (disc) has a regional code imbedded into its initial data stream. Part of the turn-on sequence involves the disc "talking to" the player and the regional code number on the disc is compared by a microprocessor built into the player.

2) Each player also has a region "number." The two numbers have to be the same or the player will simply refuse to play the disc.

A Region 4 player (Australia, New Zealand et al) loaded with a Region 1 disc (North America) will not function. The intent is to discourage people from going onto Internet or other handy to order from sources and arranging for the shipment of North American Region 1 discs to sections of the world where the films in question will not be released for months or years. As you can imagine, it did not take a savvy electronics type very long to figure out how to modify the player so that it would simply ignore the disc's region number. Within four months of the first introduction of DVD players,

outfits in Hong Kong were offering "Region Free Players" on Internet sites. We'll return to the status of this technology shortly.

Positioning DVD in the Marketplace

VHS tape analogue movies are marketed first as a rental product and then months or years later, offered as a purchase (sell through) item. A "big name" VHS tape movie costs a corner video store from US\$50 to US\$100 per copy. The corner video store in turn has the movie distributor's approval to rent out the tape for as long as the tape physically holds up. A quality tape will stand 150-200 showings before degradation becomes a problem. A tape purchased for US\$50 and rented for NZ/A\$5 (US\$3) becomes a nice profit item around the 25th rental event (allowing for cost of shelf space, general operations overhead).

Some video stores will sell a rental tape at a reduced price after it has become a slow mover. There is also a very active market between video store operators including agencies that routinely buy up well-rented movies for cleaning, repackaging and then resale in perhaps a different portion of the world. Video store owners are told by contract what they can and cannot do with movies - and when. Most store owners find backdoor methods of getting around the movie company contracts and the movie distributors know (and expect) this sort of grey market activity.

DVD presents unique challenges. Is it to be a rental item or a sell-through product? VHS tape began as sell through only and in fact the concept of buying a VHS tape and renting it did not take off until VHS tape movie distribution was several years old. A handful of (US) movie shop operators took the movie distributors to court claiming, *"We paid you the asking price for this movie, and now it belongs to us. What we do with it after we buy it from you is none of your business!"* As you can imagine, this trend did not sit well with the movie people. But they adapted, and changed the way they do business. Rather than allowing movies to sell through initially, they wrote contracts which prevented resale of the movies until they gave their approval. And the price for movies went up because the movies were now being rented for rental income rather than being sold "wholesale" for resale at retail.

DVD arrived in the marketplace in March 1997 as a sell through item with pricing in the US\$24.95 and up region. With only tens of thousands of DVD players in consumer hands, and virtually all of these owned by videophile collectors, the concept of selling movies on disc presented no instant challenge to retailers. By controlling the quantity of discs available, and allowing generous one-time mark-ups for the individual discs, as long as the number of players in the consumer universe was so small, rental was not a good business option.

But the DVD sales curve rose sharply - more rapidly it would turn out than VHS tape players 20 years prior. And soon creative retailers were experimenting with a package rental - one or more video disc movies plus a DVD player for a weekend for a combined price. (3) It worked very well. People who were not quite in the "first adopter" class "discovered" the special high quality digital images, widescreen formats and surround sound of DVD and after a weekend or two of package rentals, became DVD player owners in their own right. All of this served, by the first anniversary of DVD in North America, to further muddy the DVD retail world water. Was this a sell through format or would it turn out to be another rental medium?

Enter DIVX

Circuit City is one of America's largest home electronic retailers with more than 600 stores nation-wide. Circuit City management thought they saw a weakness in DVD and a business opportunity.

Why not create a variation of DVD - one specifically designed from the start to support a rental programme? The way "standard DVD" was developing, it was VHS tape all over again only in a

3/ Although the rental of DVD (discs) is brand new in America, rates have rapidly become quite universal. Typical is \$4 per disc for the first two, \$3 per disc for additional via overnight mail delivery with a \$5 (maximum) shipping charge. And, some mail-order-rental firms will credit the rental amount against purchase of a disc if the consumer wishes to buy after renting.

On-line NetFlix offers seven day rental for \$4 plus \$2 shipping, and allows renters a 30% discount for purchases. Firm will guarantee same day release of new films for \$5 rental fee, has 900 titles in stock but is not handling X-rated product. Firm is limiting rentals to US at this time, may expand to Canada within six months but has no plans beyond-Region-1.

Who Lines Up Where?

Supporting DVD: Anchor Bay, Artisan (aka Live), Columbia Tri Star (including Sony Music), Disney (including Miramax, Hollywood, Touchstone), Elite, Fox Lorber (not related to 20th Century Fox), Good Times, Lumivision, MGM, Paramount, Pioneer, Playboy, Polygram, Simitar, Trimark, Troma, United American Video, Universal, and Warner (including HBO, NewLine, Warner Music).

Supporting DIVX: Disney, Dreamworks, MGM, Paramount, 20th Century Fox, Universal. Note that at this time only Columbia, MGM and Warner routinely release new movies on DVD and VHS tape simultaneously (Paramount plans to do so shortly). Fear of "DVD piracy" reportedly keeps Disney, Dreamworks and Universal from releasing on DVD until VHS tape has a 30 day head start.

newer, more consumer pleasing format. They appear to have made a list of the marketing problems associated with VHS tape rentals, and then turned to their engineering development people to create a DVD variation that would correct those problems.

Problem one: The consumer has to return the VHS tape movie by a specified date and time. This might involve a special trip for the consumer. Could they not eliminate returning the disc?

Problem two: The consumer might not be able to find time to sit down and view the rented tape within the period of time specified by the rental. Could not a variation of DVD correct this so the consumer could "rent" the movie today and then delay viewing it until next week or even next month, without a rental charge penalty?

DIVX was Circuit City's answer. They developed a player that would play both "standard DVD" and "DIVX DVD" discs (note: DIVX is shorthand for Digital Video Express). This player has a telephone modem and when the consumer inserts the disc into the player, the disc goes through the modem to connect the player to a DIVX "control centre." The centre "talks" with the player and verifies the disc in the machine. Then the centre "authorises" the DIVX player to play that disc as long and as often as the consumer wishes - *for the next 48 hours*. At the end of the 48 hour period, the player's microprocessor will allow the disc (if playing at that point) to finish that play and it shuts down the disc. The content of the DIVX disc is encrypted and this extra layer of protection will further discourage illegal copying. Reportedly, support from Disney and Spielberg (who has not released on "standard" DVD yet) is attributed to this additional layer of copy protection built into the DIVX disc.

What happens here is that consumers can rent and store a movie until their lifestyle allows them an opportunity to actually use the disc. There is no penalty for holding onto the disc for months, years. Once the disc has been inserted into the player and the player through the modem has contacted the DIVX Authorisation Centre, a clock begins running. After 48 hours, "time is up" and that particular disc cannot be played again.

DIVX movies will "sell" in the region of US\$4.95. That is the disc, the carrier, the attached written material, and the right to watch the movie for as much as you wish - within the 48 hour period that begins when the disc is inserted into the DIVX player. And the disc after 48 hours of use?

Three options:

- 1) Throw it away.
- 2) Return it to the selling store for an "allowance" against the next movie (suggested: US\$1 for returning a disc).
- 3) Hold onto the disc and if some days, weeks, months or years later you wish to watch the movie again, insert the disc into the player and push a "Second Showing" button on the player remote control. This will cause the DIVX player to re-contact the Authorisation Centre where for a credit card charge (US\$2.95 is suggested) the movie disc will be "reactivated" for a second period of time (24 hours is planned).

DIVX May Not Be a Profit Centre

Market testing of the DIVX system was scheduled to launch in Richmond (Virginia) and San Francisco late in May. As CTD goes to press, the DIVX test market phase appears to have been delayed until the second week in June, caused (they say) by insufficient titles being ready in the DIVX format to allow the test to go ahead. Those opposed to DIVX on principal hoped they saw

DVD in a Nutshell

Digital video disc technology has been developed by a consortium of movie producers and consumer technology firms. Related in design theory to the audio CD, DVD is digital video + audio compressed onto standard CD-size discs. DVD discs must be played on a DVD player (an audio CD player will not work) or through a DVD-ROM (drive) equipped PC. Video quality can approach the level of theatre release 35mm film and multiple track sound can emulate the theatre sound experience. Unfortunately, viewing this high quality video and audio through a standard home (analogue) TV set significantly degrades the disc quality. Still, it is far higher quality than VHS tape or even Laser discs.

Technology built into the disc and player prevents digital copying but may not preclude making VHS tape copies from DVD discs. Players and discs have a regional coding explained in the text to discourage movies from being sold into sections of the world ahead of the movie owner's permission. Older movies are sold over the counter in the region of \$US20, newer movies between \$24 and \$30 with some examples as high as \$US40. Players sell in the region of \$US650 although as new models with new features have become available, the pricing for players has dropped by about 50% from one year ago. A target price under \$US450 is likely before the first quarter of 1999.

something more sinister in the delayed test start. For the two market test, only Zenith brand players will be available. By August, Thomson and Panasonic (DIVX) players are scheduled. DIVX projects "several hundred titles" by that time. Circuit City claims it will not keep this system to their own national chain of stores, and is courting support from other retailers. Additionally, DIVX has established an on-line (Web) site to direct-market discs to player owners. One advantage here: Discs would be shipped to consumers ahead of street release, but would not "play" until official street release date. The video market is very divided on the "appropriateness" of DIVX at this time. Here are the arguments for DIVX:

1) It is consumer friendly because it simplifies the procedures involving bringing a rental movie into the home.

2) It is consumer friendly because it will be priced at the same dollar cost as a recent release VHS tape movie, and will not require the consumer to return the physical object to a rental centre (by a certain time, or ever - if the consumer wishes).

3) It gives the consumer the option of holding and storing the movie indefinitely, either for the original play period or for a later "second play" period.

4) Although the players are more complex, through a "subsidy" programme the initial (10,000) Zenith brand players will retail for US\$500 ("standard" DVD players average US\$650 presently).

Here are the arguments against DIVX:

1) DIVX discs cannot be played on a "standard" DVD player machine (although standard DVD releases will play on a DIVX player).

2) With a \$4.95 "rent-through" distribution policy, the video store that has been built upon repeated rentals of feature films (to the point of returning the initial US\$50 purchase cost and thereafter making the store a profit) will lose this "cash cow" business. How the \$4.95 is distributed amongst the participants is shown below.

Where The Money Goes - For DIVX (and 'Standard') Discs

Circuit City has a US\$4.95 announced purchase/limited use list price planned for DIVX discs; expects individual stores to "discount" the discs to \$4.50. Here is where that will go:

- (1) \$1.50 to the studios (essentially, this means they are allowing unlimited viewing of a film for a 48 hour period for \$1.50 or for two hour movie played constantly for 48 hours, US\$0.0625 (6-1/4 cents) per showing.
- (2) \$1.50 for Circuit City of which they expect to pay US\$0.90 for the discs including 'pressing' and the boxing, leaving \$0.60 "profit"
- (3) \$1.50 to the retailer (33.3% of the \$4.50 price). This tells us the retailer's cost for sell through discs at \$24.95 is in the region of US\$16.62.
- (4) In the event a DIVX consumer renews the movie disc for additional showings beyond the initial 48 hour period, the studios will collect \$1.25 from the additional charge.

DVD Myths courtesy Jim Taylor at Videodiscovery

"DVD is not HDTV compatible" - Partially true. Current DVD players will have the same capability as today's VCR, Laserdisc, camcorder (analogue) products. To have digital to digital interfacing, to realise the true capability of DVD, will require a new generation of DVD players not yet on the market (the price of being an early adopter!). In fact, the technical format for 'HDVD' has not even been designed yet (forecast to be available in 2002).

"Audio is only 12 bits" - There is some audio "jitter" on some discs and some players; the problem is not related to the number of audio bits on the disc (see <http://www.dvdresource.com/features/glitchlist.shtml>).

"Audio level is too low" - Movie sound tracks have a greater dynamic range than virtually anything else recorded. The top level possible is 2V RMS so the dynamic range top end starts there and works backwards as a safety measure. In fact, most other recorded products (such as VHS tape) run at too high a level. The line level starts lower to preserve the tremendous sound bursts when a movie hits the big time sounds.

"There is only 133 minutes per side" (of DVD disc) - The limitation is based upon the total amount of data on a side, including the video plus the sound tracks. If there are multiple language sound tracks, the total amount of 'movie time' is shortened. With a single audio track, 150 minutes is possible. A single layer disc with slightly retarded data rate will accommodate 180 minutes while a two layer disc will easily handle 4 hours of video with multiple sound tracks.

"There are digital compression artefacts" - Evidence suggests the artefacts are not from digital compression, but rather from imperfect original (source) masters or faults with the player.

"Players cannot read dual-layer discs" - Wrong. All DVD Video players and all DVD-ROM drives will play dual layer discs. However, dual sided discs require the user to flip the disc to the second side.

"DVD is a world-wide standard" - No more so than PAL is a world standard. DVD discs are recorded in a format for the target country; PAL or NTSC (or SECAM), 50 or 60 hertz. A player formats the output determined by the player and disc, and NTSC discs from Region 1 output here as NTSC unless reworked by grey market software programmes (see 'Beating The Regional Trap', p. 10 here).

"Sony has a competing DVD format" - They have numerous formats, all for specific purposes (mostly audio or industrial) and none for consumer digital video disc application. There will not be a repeat of the Beta vs. VHS format wars in DVD.

"Dolby AC-3 Digital is 5.1 audio channels" - Dolby digital is capable of providing between 1 and 5 separate audio channels plus an optional 6th channel for low frequency effects (LFE). The actual audio packaging varies from disc to disc title, a marketing decision by the movie company. All NTSC format discs carry either Dolby Digital (AC-3) or PCM/MPEG-2 (audio) tracks which may be in mono, stereo or Dolby Surround Sound stereo (which will playback properly only on a sound system equipped with a Dolby Pro Logic decoder).

3) Movies released on DIVX and rented to consumers on a non-return basis will cut into the rental business of "standard DVD" and could in fact kill the repeat rental business totally. This worries video retailers who have grown quite content with the present "rent it - then sell it" practice. Warner, which co-developed the DVD system, initially discouraged the concept of renting DVD discs at the retail level. They have now done an about-face and are encouraging dealers to rent players and DVD discs "for a weekend" as a way of introducing the technology to an ever enlarging group of consumers. The one major studio holdout from "standard" DVD, Fox, has backed DIVX which suggests the possibility of some films being available as "DIVX exclusives" in the marketplace (i.e., not available at all, or not simultaneously on "standard" DVD).

4) DIVX is not compatible with PC (DVD-ROM) drives which means the not insignificant market developing for DVD movies through PC owners will be of no benefit to DIVX. PC manufacturers estimate they will supply 10 million PCs equipped with DVD-ROM drives during 1998: a number that quickly dwarfs the sale of dedicated DVD players.

Note: DIVX because of its "extra layer of encryption" requires a special DIVX decryption chip. PC's are not supplied with such a chip and thus lack the capability of using DIVX discs. On the

DVD Related Internet Web Sites for Australia and New Zealand

-Manufacturer/Distributor-

Creative Labs Australia at <http://www.cppl.com.au>
Thomson Electronics (RCA) at <http://www.nipper.com>
Elektroson, Inc. at <http://www.elektroson.com>

-Retailers-

Chatswood Sony Centre at www.sony-centre.com.au/dvd.htm
DVD City at <http://www.dvdcity.com>
DVD Empire at <http://www.dvdempire.com>
DVD Express at <http://www.dvdexpress.com>
DVD Media at <http://www.ozemail.com.au/~dvdmedia>
Laser Video Vision at <http://www.OntheNet.com.au>
(The) *Movie Store* at <http://www.pacific.net/~jimshana/>
Outland at <http://www.madman.com.au>
(The) *Video Shift* at <http://www.ozemail.com.au/~video>

-DVD Information-

DVD Resources has excellent detailed information including movie by movie, player by player tally of technical problems with movies and players at
<http://www.dvdresource.com/features/glitchlist/shtml>

Users forum at <http://hometheaterforum.com>

DVD Users Group at <http://dvdusersgroup@dvdresource.com>

DVD Video Group at <http://www.dvdvideogroup.com>

Problems, glitches with players, discs at ray@thunder.ocis.temple.edu

Problems, glitches with players, discs at <http://www.thedigitalbits.com>

alt.video.dvd FAQ at <http://www.videodiscovery.com/vdyweb/dvd/dvdfaq.html>

Recording DVD movies to VHS (including defeating Macrovision) at

<http://listserv.ocie.temple.edu/archives/dvd-1.html>

Review of Panasonic A100, A350 at <http://www.home-entertainment.co.uk>

Review(s) of DVD movie releases at <http://dvd.jupiter.net.au>

possibility that a PC could perform the same function with dedicated software, there are mixed views. IBM's Alan Bell believes, *"The DIVX encryption is very strong and decrypting DIVX movies in real-time on a multimedia PC will require large amounts of processing power (in the PC), which*

Parallel Importing - Restrictions on Buying Overseas

During May the New Zealand government moved to end restrictions on "parallel importing," the act of allowing the original copyright holder to stop entry of a product into the country at the Custom's gate simply because someone in New Zealand had previously been appointed to distribute the product. CDs (and by inference DVDs) are specifically mentioned in the relaxation. Australia has similar laws which are being interpreted (by those who have a commercial position to protect) to prohibit the importing of "commercial quantities" of DVD from America. The law does not seem to apply to individuals (or groups of individuals in concert) sourcing and importing DVDs (and players) from outside of Australia. DVD enthusiasts are saying that as long as movies are available months (years) earlier in Region 1, they will continue to import from America - without regard to the "parallel importing" laws. They see no reason to wait a longer time to access new releases simply because to do so "protects" an Australian distributor who can't supply the product anyhow. Section 132(1)(b) of the Australian Copyright Act is said to prevent "commercial" importing but not importing for personal use.

American mail order sources (typically US\$24.95) with US Global Mail delivery to Australia/NZ in 4 to 6 days is now common at a cost of US\$13 for 9 DVDs (see retailer list, above). As one Australian Internet chat group user comments, *"The day I can purchase recent release discs for Region 4, I will buy Region 4 (and support local merchants) in preference to foreign regions. This is not the current state of play."* And, *"We buy Region 1 because we will not wait for the local industry to get its act together. Sadly, it seems we are going down the same (dead end) road as PAL laser discs did."*

Beating The Regional Trap

Region Free Titles: There are several hundred DVD releases without regional coding including some older but still name-recognisable movie titles. Check <http://dvd.jupiter.net.au/reviews/region0.html> for a complete list. A sampling would include: Bela Lugosi Collection, Mad Max, RoboCop (and 2 and 3), The Eye of the Serpent, The Terminator and Tornado.

Neutering a Regional Specific Player: Players that have been modified are available from dealers, microprocessor chips that do far more than simply neutralise a player's specified region are available, and prolific instructions appear on Web sites world-wide. "DVD-Charger" is a European sourced chip modification that allows the user to select any combination of playback formats (PAL, SECAM, NTSC), any of the six regions for the player/disc mating, and a series of adjustments for video detail (chroma level, blanking level, standards conversion from NTSC to PAL). Pricing is in the region of \$US150. DVD Charger can be reached by fax at +31-75-6144430 but is better investigated through <http://www.psx-charger.com/dvd/> or through dvd@myprovider.com (e-mail). Player models supported include (but apparently not limited to) Denon 2000, Panasonic A100, A300, Thomson 1000, Toshiba 2006/3000/3006, Yamaha 1000.

An Australian source for modifications to Panasonic (A100, A300) and some RCA models is at <http://www.ozemail.com.au/brierley/dvd/FAQ.html> while <http://www.madman.com.au/dvd/> has modified Panasonic A350 machines.

From Internet, this comment: "*The Panasonic 505 is exceptional value for the money. It is about (A)\$500 cheaper than its nearest competitor and can be easily modified to play all regions.*"

translates to expensive." DIVX uses "Triple DES encryption system" which they claim has "renewable security" with a "continuing ability to take advantage of improvements in not only cryptography but also in improvements in silicon (IC) technology." An article appearing in the New York Times during April suggested the Triple DES security was "flawed" following a technical paper prepared by an Israeli scientific group. Triple DES is considered an interim encryption system while a more advanced system is under development.

As you might suspect, there is Circuit City and a handful of other retailers on one side and a sizeable percentage of the home movie retail business on the opposite side of this issue.

If This is Such a Good Idea ...

If the DIVX format is a sound one, what is to prevent others from coming out with their own DVD variations, essentially along the same lines as DIVX? The movie studios are in the driver's seat here because neither "standard DVD" nor DIVX could function without the contractual approval of the studios. Remember - the studios have the product (the films) and they can elect to release any given film on any format they wish without being told by someone outside their studio what to do or when. The support for DIVX at the studio level has been controversial from the day DIVX was first announced.

Late in April another announcement from an engineering firm; 'Hide and Seek'. They have created a system allowing a standard DVD disc to be coated with a special chemical polymer. The compound when subjected to the laser light each DVD player uses to "read" the information recorded on the disc "closes up." With each repeated use of the disc (i.e., each time a movie is viewed), the compound becomes less and less transparent to the laser light beam.

The thickness and composition of the disc coating compound can be varied with a high degree of precision, the creators say. If you want a disc that works only with one showing of the film, no problem. Ten showings, 16 showings, 33 showings? Simply adjust the thickness and composition of the coating. The coating is inert until bombarded with the laser light beam of the player's information reading system and only "activates" when struck by the laser beam.

So who needs DIVX? Who needs the complex telephone modem and Authorisation Centre built into the DIVX player? Who needs to keep records or tie up telephone lines getting authorisation to start playing a disc? All you need is this magic compound coating over the disc and the already existing laser light beam built into all DVD players does the "policing" of disc play for you!

The Reality of Distribution Regions

The movie firms could eliminate world regions with a single decision - simply release the same film *simultaneously* world wide. That they have forced DVD player manufacturers to create a system of world regions is proof they have no intention of modifying the decades in place system of doing business. Unfortunately, given the global reach of information technology these days and the changing delivery techniques proliferating at an accelerated pace, the regional approach to DVD release may ultimately prove to be a major problem for movie rights owners.

Mitch Koch of Disney's Buena Vista admits, *"We still have concerns about regional coding."* He acknowledges reports from outside the USA that "Disney products are amongst the most difficult to make play, on region-neutral players." Disney believes the DVD buyer today "is not the family consumer." About the "tougher to play" Disney DVDs, he notes, *"When you do the authoring and mastering, you can be more rigorous with the code you write to recognise regional coding. Our code is fairly robust and whereas some companies use the same code for Region 1 and 2, Disney does not. There is no secret code here, just an attempt to protect our copyrights."*

Regional players have proven no barrier to talented individuals intent upon busting the system. As we illustrate here (see page 10), virtually anyone can locate a "region free player" or a "modified player" with only a token amount of effort. Once the consumer has such a player in hand, they are now free to "shop the world" for movie discs. Region four, our region, is just now launching DVD. Early adopters, the pioneers in technology in our region, have been purchasing discs from Region 1 (North America) and more recently Regions 2 and 3 (Europe, Asia) for as long as discs have been available. The process is quick, inexpensive, and as we report separately here, quite without risk.

With the DVD product unrestricted by the artificial restraints of regionalised players, supported by 5 to 6 day delivery of discs from opposite sides of the world through common mail order sources, DVD becomes a world class product. Gone are the barriers of local (delayed) release of high interest movies and the frustrations associated with being someplace (anyplace) in the world other than Region one. As is to be expected, neither the movie makers nor the DVD player manufacturers are admitting either how poorly regional player coding is working or the extent of the "trans-border" shipment market for movie discs. In fact, they don't have accurate knowledge of the level of "region free players" or the shipment of Region 1 discs beyond North America. Nor does anyone else.

Warren Lieberfarb of Warner Home Video sees the early failure of regional players (mating with regional DVDs) a *"logical result of early adopters rushing in to embrace this new, superior technology."* He means that whenever there is a new "entertainment toy," there are always those who must have it first. In the case of DVD, there are several classes of early adopters at work:

- 1) Movie buffs who spare nothing to have the latest movies
- 2) Technology enthusiasts who follow new developments with the passion of explorers discovering a new world
- 3) Television enthusiasts who have "patiently" waited for the magic of digital television to arrive: it is finally here and they can barely contain their enthusiasm.

"These people do not represent the mass market which DVD must capture if it is to be a successful format. We know from observing Internet the extent of their enthusiasm and we believe these people will drive the market to the masses. The trans-border shipping of discs and the neutering of player regionalisation will pass as DVD becomes more widely available outside of Region 1."

Perhaps. But others are not so certain. Paul Brindze of DIVX is one of those. *"That is a major benefit of DIVX. Before a DIVX (format) movie can be played on a DIVX machine, the player must 'make contact' with the authorisation centre through the built-in telephone modem. If we assume DIVX players and DIVX discs migrate beyond Region 1 to Region 4 (Australia, New Zealand), before the disc can play the modem has to contact the authorisation centre. I understand it is possible for a telephone in Australia to contact a US 800 number for authorisation, but I also believe the authorisation centre can quickly determine by the call's signature that the modem calling is well beyond Region 1."*

Net result? The ability to simply decline authorisation for the player and DIVX disc. When word gets around that DIVX players and discs are useless beyond Region 1, that ends the start of a grey market for that product.

"Not necessarily," notes a source found on Internet. *"The authorisation centre can be emulated (electronically duplicated) by far less sophisticated technology than is employed within the DIVX player. All the player needs is to have certain answers ready when it contacts an authorisation location."* Translation? If sufficient DIVX players and discs ended up in Australia, for example, by whatever means, it would be technically possible for an enterprising operator to create an unauthorised centre for Australian grey market users of DIVX. An Internet source even describes in perhaps operational detail how this could be done. And all of this is happening even before DIVX begins *test marketing* in the USA!

The Real World

DVD is the first consumer oriented product to arrive in the marketplace since the world deployment of Internet. This fact alone could have a very dramatic effect on the way DVD develops and how fast that development takes place.

Internet supports "user groups" and "chat sites" where people with common interests or questions congregate. Although they may be thousands of miles separated, once inside of (through their computer) or simply outside looking in (monitoring but not participating in) a user group, suddenly everything about their new field of interest moves in double or triple time. With the speed of light, information, views, and arguments evolve on the PC screen. What this quickly does is provide a way for the commercial interests in a field (such as the movie studios in our DVD report) to take the pulse of the world. Some "chat sites" routinely include major studio executives who find themselves defending or extolling corporate positions in real time. This dialogue and fast response two-way exchange with the consumer is brand new to the merchandising world. And DVD enthusiasts tend to be heavy users of these Internet facilities. (4)

Policing of DVD player region tampering falls at the moment on the desk of the DVD player manufacturers. Master patent holder Matsushita in licensing hardware firms to build their DVD patented players requires that a player be "reasonably impervious to tampering." On closer examination, this turns out to mean the player builder cannot include a toggle switch on the back deck (or a software command in the menu) that allows the user to switch regions or switch to a region-free operating state. This is reminiscent of early American CB radios where the law limited transmitter power to 5 watts output. Several manufacturers of these items in the 1970s built 15 watt output radios and then installed a resistor which cut the power back to the legal 5 watt limit. In their instruction manual was the not cleverly disguised phrase:

"Do not - do NOT under any circumstances clip this resistor out of the circuit as this will cause this transceiver to operate at 15 watts output."

By monitoring Internet and watching trends in the marketplace, Matsushita claims it is advising manufacturers under license when they see "tampering trends" becoming "prevalent" in the marketplace. Under the terms of the licensing agreements, if the manufacturer does not take engineering steps to make regional tampering more difficult, Matsushita could revoke the patent license. This has not happened yet.

Most of the industry believes, like Lieberfarb, this is a "passing fad" that will "disappear quickly when the market is flooded with legitimate product sufficient to meet the demand in each region." The firms that design and manufacture MPEG processing chips for the DVD players are also aware of the problem and are promising the next generation of player chips "will make machines more tamperproof than the first generation players." One way they will accomplish this - take all of the decoding functions out of the hardware segments of the players and move these functions to software algorithms which they believe "will eliminate the possibility of easy, physical modifications."

Early results from DVD are impressive for a new technology. Chain store operator Musicland found DVD had captured 3% of their video business by December, rising to 8% four months later (April); quite out of proportion to the very small DVD universe at this time. *"It is time for a new configuration to come along to give new excitement to the business and do what we've all loved in the past - to get people to buy the same thing all over again in a new format."*

4/ For example, instruction to modify a DVD-ROM drive for region-free playback is found at <http://www.dvd.anu.edu.au> under the title "Create drive exe."

TECHNOLOGY BYTES

...BITS and BYTES you may have missed in the rush to make a dollar...

May 27, 1998 ♦ VOLUME 98-5-47

Satellite TV & Radio

World Soccer France 98. RFO digital feed on Intelsat 180E (4095/1055LHC, 27.500 and 3/4) plans to televise live all matches starting June 10th. Digital feed will carry one or two games simultaneously, with French commentary. Signal is on global beam but requires dishes of 3m+ size in New Zealand and 3.7m+ size in Australia according to reports to SatFACTS Monthly. There is a market here for intense daily coverage through clubs and bars which will in particular miss terrestrial or regular satellite TV coverage of the games leading up to the semi-finals and finals.

Indovision future? SatFACTS for May 15th reported Indovision Guide for month of May advising subscribers to begin their plans to convert feeds and LNBs on present DTH systems to S-band Cakawarta satellite (107E) in preparation for July 31st announced shutdown of Palapa C2 twin digital transponders. Given the political and economic upheaval within Indonesia now ongoing, the future of Indovision as a service seems very doubtful. Service is controlled by one of (many) sons of ex-President Suharto through politically favoured business group. Of note - our May 15th SatFACTS when read at Star TV Headquarters in Hong Kong produced interesting query to us: *"We were shocked to learn about this move to S-band as our own people (who work within the Indovision arena) did not know about this!"* Perhaps they should spend more time reading the Indovision (monthly) Programme Guide - which was our source for this information!

Hybrid FTA digital plus analogue DTH receivers. On the way with first deliveries planned for July 1-15. Good: Unit is same size as standard digital IRD (analogue reception "board" fits nicely inside of digital case and shares power supply as well as RCU [remote control unit]). Better: Price for analogue on-top-of-digital will be in region of A\$100 at dealer net over digital only pricing. Not so good: First versions (two are known to CTD, more are undoubtedly on the way) have polarity switching or (magnetic) polarisation control built in but not actuator control. This means those purchasing new combo units requiring actuator (dish mover) control will still require outboard, separate controlled "box" which one Australian distributor will be offering as optional extra. First "hybrid-combo" unit is to be tested by sister publication SatFACTS and will appear in July 15th edition of that magazine.

Why did Hyundai shut down manufacturing facility turning out HSS-100 series satellite receivers? Pressure from government. When Korea's economy went into tailspin during 1997, International Monetary Fund (IMF) exercised rights under funding arrangements to Korea to dictate changes in the way Korean firms were operating. Hyundai, LG and Daewoo have all been told they must "close down non-core business operations" as condition of continued monetary support by IMF. Firm's have had to evaluate their ratio of debt to equity (capital) and where the debt exceeds 200% of the equity, come back with solid plans to reduce debt to that level by 1999. Hyundai was not making money at satellite receivers, could not justify continued operation of satellite receiver plant. The major Korean conglomerate firms, called chaebols in Korea, are under strict instructions to clean up their financial acts or face severe government restrictions. Samsung is also affected, plans to sell off divisions that are not profitable and raise US\$5 billion to reduce its debt-equity ratio. This option - sell off subsidiary firms which are losing money or not returning a profit to the level's specified by government - is reshaping the CE business in Korea. One side effect of this - more "smaller" Korean firms picking up the pieces as chaebols get out of non-profitable operating areas. What this may mean in the satellite field is the emergence of newly named and formed companies who could lack the staying power of the majors. There is a caution here for anyone tempted to deal with Korea.

Hyundai TVC3200 digital satellite receiver originally designed for the European market has become available through Kristal Electronics in Queensland (fax ++61-7-4788-8906). The receiver received rave reviews in European journals but has not been tested nor reviewed to date in the Pacific.

Nokia, not respected for its failure to supply support of its satellite IRDs for Asia and the Pacific, is back again with a specific for this region model. The 2000 S Free To Air receiver has just been announced with corporate data sheets listing features for "Asia Pacific Region." Nokia claims plug and play installation, Chinese user menus (one assumes English as well but this is not clear from the English language data sheets), automatic channel set-up, MCPC + SCPC for C and Ku bands, either PAL or NTSC, rear panel temperature activated

An Austar Technician's Solution to Keeping ex-Galaxy IRDs Hot

- 1) From remote control button, select menu
- (2) Select menu option number 6
- (3) Enter 4252 as code (note: This may not be correct for all IRDs)
- (4) Select Manual Tune
- (5) Select frequency (option 1), press enter and key in 12689
- (6) Select "Apply these settings"
- (7) IRD will reload with new Austar channels

...

If Austar elects to transmit additional decoder updates (very likely), to be certain of receiving these - after completing preceding, then:

- (8) Select menu button on remote
- (9) Select installation menu, and select number 6
- (10) Enter 4252 as code (see above)
- (11) Select "Restore factory settings" option
- (12) Press enter
- (13) Press enter to change
- (14) Select exit key to return to Austar

cooling fan. Receiver handles 1-42 Msym, has 16 MHz Motorola 68340 processor chip, 1 Mbyte RAM and 1 Mbyte Flash memory and is equipped with menu driven UHF modulator tuneable over frequency range 470 to 862 MHz. Modulator output details not specified (i.e., audio subcarrier output frequency, video modulation format although some form of PAL is evident). All outputs are RCA (Cinch) plugs - no SCART. No pricing is given and no details on how the receiver will be supported in the Pacific and Asia. Details, perhaps, from Jacobson's at fax ++46-141-220-111.

Hallmark failure on Hyundai and some Nokia IRDs during period May 15-21 was result of modifying the programme channel Msym rates for Hallmark and KIBC at the Subic Bay uplink site. MCPC bouquets establish individual Msym for each programme channel and prior to May 15th both Hallmark and KIBC ran at 4.0 equivalent. This was modified to 3.89 for Hallmark and 3.5 for KIBC and instantly receivers quit functioning. However, Av-Comm R3100, MediaStar D7 continued to play along with XCOM receivers which Hallmark distributes to its cable affiliates. On May 22, after being appraised of the situation by Hyundai and Nokia owners, Subic Bay agreed to "fine tune" the data stream and most receivers that lost the bouquet now report it is functional again.

Hallmark's present 24 hour telemovie format will change as early as September under new agreement that brings Jim Henson of Muppets fame into the network. Kermit and Miss Piggy characters from Henson will use 12 hours per day of the Hallmark service while the present telemovie schedule will continue in the second day part.

Nickelodeon network and Children's Television Workshop (CTW) are planning new children's channel to be called Noggin. Channel will begin when Nick parent MTV goes to digital format in January (in USA) making available additional spectrum space for service.

NBC Asia has begun apparent slow transition to new National Geographic Channel Asia (NGCA) format detailed in CTD #47 (p. 10). NBC Asia programme channel is being replaced by new service built around programming produced with partnership of National Geographic Magazine and by 1 July NBC network programming from USA will have been reduced to 4 hours daily. NGCA programming began May 18 from midnight (NZT) to 2AM with a repeat from 4AM to 6AM. Additional programming from NGCA will replace NBC material throughout June in a slow "ramp-up" to new format by July 1.

French TV5 plans to replace CFI service on Palapa C2 (4160/990 Hz) has new target date for changeover: May 28. TV5 and CFI have been locked in bureaucratic tussle within French government as to which service more properly represents the French "national image" overseas. CFI has run into difficulties with programming showing too much human anatomy and with scripts that include words not permitted in many Middle Eastern countries. CFI began as a news feed service, TV5 launched as a total French service but both have grown into now competitive departments within branches of the French government. TV5 is carried on AsiaSat 2 within European bouquet digital package, but misses large scale audiences throughout Asia because of the "digital handicap." Under the plan, CFI will terminate, TV5 will replace on Indonesian operated Palapa C2. The original date was March 4, has been postponed repeatedly. CFI has been seen as a "test signal" on the same Palapa C2 at 4080/1070 Hz suggesting the Indonesians may be preparing to allow both CFI and TV5 to have satellite space rather than closing down CFI service in favour of TV5. Reports that the 4080/1070 test service is "very strong" through Australian and Pacific have been frequent in the week leading up to publication.

Y2K - Countdown to 01-01-00 - 583 Days

As the new century begins, a growing fear that anything equipped with a microprocessor, and virtually all computer and computer programmes will "crash." The Year 2000 Millennium Computer Bug (Y2K in computerese) is being variously described as "Not a major problem" and "likely to plunge the world into darkness and chaos." Between those two extremes, a realisation that there will be difficult, perhaps not preventable interruptions of normal life quite beyond the correction of mere mortals. The world's media is beginning to cover this potential threat to civilisation in a mainstream manner as this report transcribed from American ABC network World News Tonight (Peter Jennings) on May 22 illustrates.

"Now - about the 2000 computer bug update and the fear that many of the nation's computers will go wonky when 2000 produces too many zeroes. The leaders of the world's industrial nations had this on their agenda last week in Britain. ABC's James Walker is keeping us up to date.

"At his new home in rural Arkansas, Gary North has his own natural gas well. He says it is his ticket for survival.

"When I get upset with the year 2000 threat, I come out here and turn on this valve. This cheers me up."

"The well gives him his own electrical power which he thinks he will need when the computer bug strikes. He believes it may shut down the entire country.

"If electrical power goes out for 60 days, you will lose most of what we call western civilisation."

"Although North's view is extreme, many agree it is not far fetched.

"Steve Hock is a technology analyst who has just completed a detailed study the financial reports of the 250 largest corporations in the United States. These companies were under government order to explain how they are combating the year 2000 problem.

"Half of these companies stonewalled and gave the government no meaningful information at all. And those that did give information have made very little progress with protecting themselves from the problem."

"So little progress that it is not at all clear whether auto makers will be able to get the supplies to build new cars - or that the nation's energy system will be able to deliver power.

"With fewer than 600 days left, the Federal government is doing no better. The government accounting office has just released a report saying that at the very best some vital computer systems will not be ready, including air traffic control and payments to disabled veterans.

[Video on screen showed just released US Government report titled, "Year 2000 Computing Crisis - Potential for Widespread Disruption Calls For Strong Leadership and Partnerships"]

"As time marches on, professionals who have to fix the computer bug are more and more pessimistic. In a current survey, more than a third of the (computer) professionals plan to take their money out of banks in case the banking system fails. Computer expert Ed Yourdon believes there is just too much work to be done and too little time.

"It is roughly equivalent to trying to produce a baby in one month by impregnating nine women. You can't just speed it up at the end in an attempt to accomplish something that should have been started much earlier."

"Which is why he is moving his family from New York to the country where there is less demand on power supplies and he believes less chance of being bitten by the Millennium Bug."

Aurora testing on Optus B3 (12.407V) is CA and utilising 40 UEC 642 receivers purchased for purpose. Apparent programme line-up is: (1) Business TV, (2) Horizon, (3) Pacific Business TV and radio channels for Easy Listening, Top 100, Light Classical and Cafe Jazz. Optus hopes to be able to move Aurora to horizontal side of B3 before officially turning service on in mid-July (see report at this issue of CTD).

Austar "radio" (audio) channels that have appeared within temporary FTA bouquet (12.564 B3, Hz) are in fact from Satellite Music Australia. There are 8 "audio" channels, all fed by CD stackers as follows: (1) Country, (2) Dance Techno, (3) Light Classical, (4) Top 100, (5) Environmental, (6) Cafe Jazz, (7) Radio Extra, (8) Classical Hits. Yes, there is a "similarity" here with some of the audio channels reported for Aurora (above). Fans of BBC World Radio and other former Galaxy audio channels will be disappointed to learn there are no plans to bring these back via Austar.

Ted Turner On Rupert Murdoch - Now It Is a Tradition .

CNN founder and Time Warner Vice Chairman Ted Turner taking pot shots at his favourite target; Rupert Murdoch.

"The biggest thing about Murdoch is that he uses his power to control governments and squeeze as much money as possible instead of helping people. Al Capone made a lot of money too."

Echostar IV launched earlier this month for use at 119/148W reportedly has solar panel deployment difficulties. Satellite was to go to 119W where present satellite(s) would be moved to 148W.

ChinaStar 1 launch was to have taken place May 24th and if successful should go to 87.5E.

Russian sources now saying never launched spare Gorizont 33 will not be launched (August had been scheduled date). And Express satellite scheduled for December will also not be launched. First two Express satellites put into operation have had massive transponder failures so it appears the Russians have decided to get out of the low-cost, expendable geostationary satellite business!

EWTN, PAS-2 within California bouquet, was one of many services adversely affected by failure of PanAmSat/Hughes owned and operated Galaxy 4 satellite May 20th (May 19th, 1820 EDST in states). North America satellite developed control problems now believed to have resulted when fuel tank ruptured causing satellite to spin on axis. Galaxy 6 has been moved from 74W to Galaxy 4 position at 99W as replacement and spent "4" has been lifted into higher orbit out of harm's way while Hughes attempts to see if satellite can be resuscitated. Investigation of cause of satellite failure is ongoing - more than 10,000,000 users of US paging systems lost their service when the satellite failed.

Major shortages of Ku band DTH hardware in North America. Sales of home DTH systems have exploded catching hardware manufacturers with inadequate inventory to meet the demand. Home systems have fallen in price significantly from original US\$750 retail (many now sell for less than US\$200) and home dish industry has just come out of first quarter of year growth spurt that saw 494,000 new dish owners in 3 month period. Thomson, a major supplier to North American market, believes the high inventory levels of one year ago caused suppliers to down rate the anticipated sales for this year. Thomson reports it plans the purchase of critical parts for IRDs 120-180 days in front of their actual use and it is a shortage of unique parts used in satellite IRDs which is creating the present receiver shortage. The satellite industry continues to subsidise the retail sale of home dish systems which means the consumer is being lured into the service by an artificially low cost of acquiring the equipment. Echostar admits it costs US\$300 to sign up a new subscriber while Primestar spends US\$550 for each new subscriber. This represents giving new subscribers between 12 and 18 months of "no charge" programming service in the form of subsidies on the equipment.

Actual position of ACCC in Australia concerning failure of Australis/Galaxy and possible resumption of service by another supplier remains clouded. Professor Alan Fels appeared on Australian news show Sunday May 24th and in response to direct questions about his views on Foxtel versus Optus gave no hint of his thinking. He did say, *"I believe consumers should have access to two services with a switch allowing them to select between Foxtel or Optus programming."* He also believes *"the disappearance of Australis is not necessarily a bad thing - if the remaining competitors get together within the guidelines of the Trade Practices Act."*

UniSat system installed for University of Auckland access to satellite feeds distributed throughout campus for use by language, political science and related educational disciplines, has grown to 4 satellite dishes and 12 channel cable style "headend." The university records programming for delayed use and distributes programmes "live" to television receivers located in the Tamaki Campus Library.

StarNet terrestrial delivery in Auckland region of Internet via terrestrial 12 GHz transmitters installed on Sky Tower (SatFACTS #40, p. 6) is expanding. The IHUG group now leases a full PAS-2 Ku band transponder. is moving rapidly to deliver service directly to satellite dishes via PAS-2 using 90 cm size dishes for virtually any New Zealand location. Service will offer download from Internet with delivery speeds in region of 400 kbps and use toll free return telephone line allowing interconnection by clients to master link connecting to Internet for the return path.

DirecTV plans to push hard for DirecPC service (in USA) as partner to television DBS is being curtailed. Hughes Network Systems division will take over marketing of DirecPC which has been less than successful to date. DirecTV has passed 3.5 million subscriber mark. PC version which allows 400 kbps downloading from Internet has faced and been unable to solve myriad of technical problems. New push will concentrate on placing DirecTV cards into PC owner's machines for primary purpose of expanding television universe. DirecTV originally agreed with Microsoft in 1996 to launch PC version using Windows 95 operating system but data services within TV package have not yet materialised and if they do now - are likely to be built around Windows 98 operating system.

Who Uses Internet - and How They Use It

Survey of 40,000 Internet users in North America - the results:

- 1) **Age group 18 - 24:** 75% surf the Web looking for entertainment and 29% favour online gaming. Chat rooms were used by 45%, news and information was accessed by 65%.
 - 2) **Age Group 35 - 54:** 82% used Internet as news and information source, 45% surf looking for entertainment, 18% venture into chat groups and 13% use online games.
-

Echostar's DBS product in USA will be enhanced with HDTV all format decoder IRD in first quarter of 1999. Firm in deal with SGS-Thomson Microelectronics is creating system that will allow movies at 30 frames per second, sport at 60 fps. Echostar box claims ability to handle all formats of HDTV but preference in transmission will be for 720p service because of best transmission bandwidth efficiencies.

Digital TV & Radio

COFDM - what it is. Coded Orthogonal Frequency Division Multiplex is European developed system for transmitting terrestrial digital TV. It differs from the American 'VSB' digital terrestrial service significantly and proponents of each are anxious to convince uncommitted world regions of the superiority of their system. VSB is more like our existing analogue transmission format than COFDM but neither can be directly compared to analogue. The major plus for COFDM is an in-built ability to cope with and effectively ignore terrestrial multipath transmission errors. In a region where TV signals (whether analogue or digital) will bounce off of tall buildings and hills, to arrive at the viewer's TV aerial from a number of different directions, VSB is at a disadvantage (see, **DTV Reception Tests**, below). COFDM builds in a multipath 'error' correction system which relies upon the use of GPS (Global Positioning Satellites) to achieve a millisecond time base accuracy to control the transmission of terrestrial digital signals. New Zealand, if it adopts a terrestrial digital broadcast service, is likely to be a candidate for COFDM given our inherent problems with multi-path and the strings of signal repeaters (translators) which require precision control of radiated signals.

Another basic difference in approach to digital - between North America and Europe. European planners have shown little or no interest in HDTV per se, see DVB-T (digital video broadcasting terrestrial) primarily as a method of squeezing more programme channels into restricted spectrum space. Thus as DVB-T migrates from theory to implementation in Europe, the transmission equipment being installed will typically not handle HDTV transmissions. To match this, TV set makers for the European market have designed receivers without the HDTV capability. It will be the lack of receivers with HDTV capability that will ultimately dictate when (if ever) HDTV does come to Europe since implementation will require yet another generational swap out of home TV receivers to accommodate the HDTV formats. Australia's plan follows the North American approach which will allow either HDTV or multi-channel SDTV (standard definition digital, multi channel) transmissions at the decision of the broadcaster.

Too good to be true department? An Australian man, Adam Clark, claims to have invented the solution to sending high quality, real time video and audio through complex terrestrial telephone plants without degradation. Many are sceptical of the claims but demonstrations for telecommunication innovators are drawing rave reviews along with, *"I cannot believe I have just seen what I just saw!"* comments. Here's the story. Clark makes a living as a director of event management company Centre Stage Productions, says he has taken a "totally new and different approach" to forcing gigabits of video data through a kilobytes capable copper telephone line. He calls the technique Adam's Platform and it involves compression of video images by as much as 1000 to 1. Among the demonstrations he has chosen is taking 1.3 gigabit video and compressing it down to a 1.4 megabyte floppy disc. And delivering 768 x 576 (pixel) video and CD quality audio down a standard copper telephone line to a 28.8Kbps modem. The present system was developed on an Apple Macintosh PowerPC using AppleTalk dial-up. No patents have been filed, but major firms including Telstra are said to be after the technology for their own use. (Additional information can be found at www.theage.com.au if the file has not yet been deleted.)

DTV reception tests using pioneering Washington (DC) test stations. Two stations with differing transmission power and height above ground for transmitting antennas have funded testing to determine what reception problems will be within their respective services areas. Summary: 80% of the homes within predicted coverage contour will have satisfactory reception using an outdoor antenna, 60% with indoor antennas. Testing to date has surveyed 520 different outdoor antenna models and designs, 114 indoor antennas. Multi-path reflections have been biggest technical problem and survey found increasing transmitter power does not reduce reflections and disruptions to reception. Taller transmitting antenna was modestly better than lower antenna with higher power. Of the 20% of receiving sites unable to produce satisfactory reception, the advice is basic: "These people will have to depend upon their local cable operator."

Thomson Microelectronics has announced development of single chip HDTV decoder (STi7000) for next generation TV receivers. Chip processes MPEG-2 signals and adds all format decoder in single device. External

WITH ALL OF THOSE CHANNELS - What do they watch???

Far North Cable TV (Doubtless Bay) currently offers subscribers more than 40 channels of programming, perhaps more than any community in the South Pacific. With 11 satellite dishes, and local programming on 3 channels, the service passes slightly more than 600 homes with slightly under 1/3rd of those homes subscribing. The system recently asked subscribers to participate in the (third annual) viewer survey of channels carried versus channels watched. A suitable form was supplied and 41% of the subscribers completed and returned the survey. Far North packages programming in three main tiers with two sub-tiers also on offer. The "Sky Only" tier consists of Sky Sport and Sky Orange; Basic Cable consists of 14 channels; Premium consists of 40 channels. Sky's two channels can be added to either Basic or Premium as sub-tiers. Pricing ranges from \$25 per month for Basic to \$80 for Premium plus Sky. Subscribers were asked to indicate whether they watch the various channels in their chosen level of service, (a) Daily, (b) Weekly, or (c) Never. The ethnic mix of the community is primarily native NZ with a higher percentage of retired households than is the national average.

Service	Daily	Weekly	Level
Sky Sport	84.6%	15.4%	Sky, plus
TV1	83.3%	13.9%	Basic
TV3	69.4%	16.7%	Basic
Discovery	63.9%	36.1%	Basic
TV2	58.3%	25.0%	Basic
CNN News	52.8%	22.2%	Basic
Weather	50.8%	14.3%	Premium
BBC Wrld	42.9%	23.8%	Premium
TNT Mvies	41.7%	26.0%	Basic
NBC Asia	39.5%	58.6%	Basic
SPN Sport	38.9%	47.6%	Basic
ABC Aust.	33.0%	24.0%	Premium
Classics	31.5%	30.6%	Premium
CNBC	30.1%	33.3%	Basic
Sky Orange	29.8%	46.2%	Sky, plus
Deut. Welle	23.8%	24.0%	Premium
CMTV	22.2%	25.0%	Basic
Star News India	14.9%	23.8%	Premium

Service	Daily	Weekly	Level
MCM Msc	11.1%	41.1%	Basic
TV4	10.8%	33.5%	Basic
WorldNet	10.5%	13.9%	Premium
Cartoons	9.1%	33.3%	Premium
Racing	8.7%	4.4%	Premium
GMA	8.7%	0%	Premium
CFI Paris	8.1%	19.0%	Premium
TV5 Paris	8.1%	24.2%	Premium
RAI Italy	7.5%	7.5%	Premium
TVSN	5.0%	36.1%	Basic
EWTN	4.8%	13.1%	Premium
CIC-31	0%	23.8%	Premium
USA Direct	3.2%	18.5%	Premium
JET-TV	0%	23.8%	Premium
RTVE	0%	19.0%	Premium
CCTV	0%	14.3%	Premium
NTV Moscow	0%	11.2%	Premium
Test Ch.	0%	9.2%	Premium

64 Mbit DRAM memory is required for HDTV, 32 Mbit for standard definition MPEG-2. Pricing not announced; samples now available with production in fourth quarter.

Digital copyright legislation after stalling in US Senate Committee seems headed for vote. Major snag was language that would have made consumer electronic equipment designers responsible for including in their products safeguards against the device violating copyright. Language was modified to read: *"Nothing in this section shall require that the design of or design and selection of parts and components for, a consumer electronics, telecommunications or computing product provide for a response to any particular technological protection measure."* Translation? CEMs will not be held responsible for how a device is used as long as intent of device is not openly to circumvent copyright protection schemes.

HDTV transmissions are now all but certain in 9 of top ten markets in USA by November 1st. Only Chicago appears to be late in starting service, attributed to problems with adding HDTV transmission antennas to existing tower space available. Transmitting antennas and attachments for HDTV require significant new "tower loading" and in some major areas the choices for additional tower space are hampered by aircraft safety lane considerations and shielding effects of downtown centres.

HBO, America's pioneer pay TV movie firm, has come out in favour of 1080i HDTV format - says it will launch two channels of HDTV movies in 1999.

Consumer Electronics

Web browser box created under RCA Network Computer branding has been shutdown as product backup network was taken off the net on May 3rd. Customers who have purchased the NetChannels box are being given a full refund when box is returned to dealer store where purchased. Closure comes after NetChannels operator of service was unable to find funding to keep service alive. RCA involvement through parent Thomson has been to produce box and "lend" name branding to project. RCA may have produced as many as 40,000 of the custom set-top units, the service itself claimed only 10,000 subscribers. Service was flawed by software errors and inability of consumer users to access network control centre through local calls.

Book explaining DVD. Locate "DVD Demystified" by Jim Taylor which comes complete with demonstration DVD containing some famous video out takes as well as on screen demonstrations illustrating how video compression works. Available in Australia on order through Barnes and Noble at A\$42.95 (also try Amazon.com on Web).

Demonstration DVD disc from Simitar Entertainment runs 60 minutes and is being used in North American stores as sales tool. Clips from recent films, description of how DVD functions and choices facing consumer in both players and discs. Title is "Ultimate DVD Demo" and is scheduled for public release shortly.

Dolby Digital claims 719,000 DVD players have been produced world-wide as of April 30th with 95 separate DVD player models now available at one or more regions around globe. Projected growth for April-June period is 270,000 additional units.

Warner Home Video products went on sale in DVD format in UK week of April 27th with suggested retail price equivalent to US\$27 per disc. Multi-channel audio is being done in Dolby Digital AC-3, not rival MPEG-2 audio. Discs are in PAL format.

Chinese (Region 6) DVD players will "officially" go on sale later this year; projections call for 2 million unit sales by 2002. Toshiba is building plant there.

Delayed test marketing of DIVX system in two USA markets (Richmond, Va and San Francisco) apparently tied to shortage of available DIVX titles ready. Circuit City could launch test as early as May 31, but second week in June is better bet. One other minor hitch - Zenith brand players built by LG Electronics in Korea come to USA minus circuit board called "security module." This portion snaps into position inside of player, and then player is tested before being reboxed for shipment to retail outlet. Process adds several days to routing of players from Korean plant to retailers.

Fire hazard alert. National brand colour TV receivers built in period 1983 - 1989 are subject of product recall in Japan. High voltage section of receivers has resin coating which over time may crack and allow electrical discharge jumping to nearby metal parts, igniting dust that results in television set fire. National brand products were sold in New Zealand during this period.

JVC has announced backwards compatible analogue S-VHS format called S-VHS ET. Concept is to make higher quality analogue recordings which can play on standard VHS machine interchangeably using standard VHS cassette. Market is satellite TV receivers which typically produce higher resolution video to TV set than cable or terrestrial delivery methods. S-VHS ET (in NTSC format) will record 420 lines (standard VHS does well to record 240 lines) with terrestrial NTSC typically in 330 line range and satellite TV in 500 line region. When S-VHS ET is played on VHS machine (i.e., backwards compatible), players will show reduced (240 line) resolution or same as present VHS tapes. There is one proviso: Backwards compatibility only works with VHS decks equipped with S-VHS quasi-playback (SQPB) and there are very few such decks around. Sony has announced similar improvement in 8mm and Hi8 formats increasing 8mm resolution to 280 lines (16% improvement) and Hi8 to 440 lines (10% improvement).

Price reductions from JVC in digital camcorders. GR-DV3 has US\$1,599 price (dealer cost US\$930) while GR-DVM5 has \$1,799 list price (dealer cost of \$1,050). Both have IEEE-1394 terminals, 12 digital effects, 100x digital zoom. DV3 has colour viewfinder while DV5 has 2.5" LCD with 400 line resolution.

Paramount (Home Video) announcement it will release films in DVD format has not included specific approval for release of record earnings Titanic film. Paramount believes it will release new DVD films simultaneously with films released on VHS, but has avoided answering Titanic availability question. Firm remains concerned about effectiveness of "Regional Coding" and is concerned that *"reported easy work around of region coding will destroy our corporate timetable for releasing films into world parts."* (See full report on p.2, this issue)

Sony digital Walkman. A portable digital VCR that uses MiniDV camcorder cassette. Unit has IEEE-1394 bus for bi-directional dubbing and editing between digital devices, composite and S-video outputs for connection to analogue equipment. Units run on AC or DC with entry level pricing starting at US\$1,399 (GV-D300).

Contrary to hype: Chip maker Zoran blames "soft DVD market which has not grown as predicted" for flat first quarter financial report. Company added, "High volume players have not stepped up the sales activity and shipments of our DVD chips have slumped as a result."

Web TV growth. 56,000 subscribers April 1997; 300,000 April 1998.

Cable/Fibre/MMDS/Pay TV

Kerry Packer's PBL is expected to move quickly to exercise option held to join News Corp and Telstra in Foxtel venture. PBL is believed to hold dual-choice option: Either one-third of total so all 3 are equal, or if that is problem to Telstra, then 1/4th interest taking 50% of News Corp present half interest in Foxtel. High level source at PBL is quoted as saying, "*If the (pay TV) industry starts rationalising in a meaningful way, it is highly likely we will exercise our option.*" Foxtel signed in-the-event contract with Hollywood studios February 25 making films previously sourced by Australis/Galaxy now directly available. The contract runs until December 31, 2007 and allows Foxtel to save approximately 30% on the cost of films and other Hollywood product (including highly rated "TV1" service).

Palau, Micronesia cable TV system has passed 2,000 subscribers. Plant is now 36 miles in length, used (Magnavox) 330 MHz equipment, all aerial and carries 19 channels of service including some fed by tape from USA.

British regulators have lifted restraints preventing telephone media from becoming involved in delivering television programming. BT and others had previously been banned from TV side of business. Lifting of ban is immediate for estimated 17% of UK which is outside of cable franchised regions, bans will go away "in layers" for balance of country between now and 2001.

Wireless Cable (aka MDS) has received setback from Standard and Poor's rating service. Firm has released report indicating it no longer believes Wireless Cable represents a viable alternative to normal cable TV or satellite TV delivery and accordingly has reduced rating for all wireless cable operators. Wireless has suffered greatly from rapid development of Ku band DTH in North America and more recently cable television industry expansion into lower cost alternate telephone delivery services.

US West Communications is apparently first large scale telecom to offer existing telephone subscribers access to multiple channels of television including pay per view over top of existing telephone service. System utilises NextLevel (GI) set-top interface boxes and VDSL (very high speed digital subscriber lines). "TeleChoice" is to be available to 400,000 homes in Phoenix (Arizona) market by year end. Two similar trials are underway in New Zealand by Telecom with approximately 400 homes taking part.

Shortage of cable TV system properties for sale is driving up prices in North America. Dollar volume of cable system sales (to new owners) is running ahead of 1997 record year with systems commanding prices that run from 7 for small systems to as much as 14 times cash flow for larger systems. For six month period ending March 1, cable TV subscribers in US grew 1.8%. Penetration nation-wide is now 63.5% (of all homes passed).

Terrestrial Broadcasting

Solomon Islands is getting their first taste of local, terrestrial television with an assist from TVNZ. Solomon Telekom installed 3m dish for Intelsat 180E to take World Cup Soccer feeds through TVNZ digital package there starting June 10th. TVNZ supplied dish and receiver, loaned Solomon Telekom 100 watt VHF channel 2 transmitter. Costs as reported in Solomon newspapers were in excess of \$300,000 in local currency: Telekom hopes to get a portion of this back through local merchant sponsorship. World Cup TV was instigated by Solomon Islands Football Federation. The Solomons have been toying with creation of local terrestrial service for several years, a project held back by ongoing civil hostilities now largely resolved. The island group is largest geographic and by population region remaining in the Pacific without a national television service. Hopefully the VHF channel 2 selection was a short-term, temporary, assignment. Solomons are located in region where widespread "skip" interference occurs with great regularity and channel 2 is most susceptible of all to this interference. Plans to keep the service operating following World Cup are being pursued.

Studio and office complex for new "Prime TV" are under way near Albany (north of Auckland). Satellite dishes are prominent part of the planning including need to properly "see" AsiaSat 2. Prime hopes for August start in major New Zealand centres.

US television stations that elect to utilise "space" digital spectrum space/capacity to transmit "ancillary" services will be paying a fee to do so. Debate as to how fees should be structured, when they should start is ongoing with ranges from 1% to 10% of gross suggested and two-year start-up moratorium favoured.

Our mistake. We reported NBC network in USA was pushing 720p HDTV format and should have said it supports 1080i format.

Support credits - this issue. Our thanks to Ken Grady, David Leach, Gareth Welsby and "The Simple Man."

GALAXY FAILURE and SHUT DOWN - Summary Report

As first reported in SatFACTS Monthly May 15th, Australis / Galaxy was forced into receivership by court order May 5th. As this issue of CTD is closed, the status of service to Australian pay TV subscribers is summarised below. This is a fast changing scenario and what follows is guaranteed to be partially or completely out of date before you read these words. A more detailed report will appear in SatFACTS for June 15th.

✓ **Who is shut down?** Australis/Galaxy MDS subscribers have only (always optional) Chinese, Italian services remaining. English language news, sport, movie, entertainment channels were shut down at midnight Australian eastern May 21. There are believed to be 25,000 MDS subscribers with no service.

✓ **Australis/Galaxy satellite** subscribers can continue to receive their former group of channels if they do one of two things: (a) Switch their IRD to channel 22, wait ten seconds, switch back to channel 1 and the receiver will have been reloaded with Austar services; (B) Unplug the IRD, wait ten seconds, plug it back in. As the IRD reboots, it will come back on Austar channels.

Austar, the regional pay service, has formed a 50-50 joint venture with Optus Vision to provide temporary ongoing programming. At this time, Austar is using transponders 14 (12.626) and 15 (12.689) horizontal. The 12.626 transponder has been used for several months previously by Optus Vision for DTH "tests."

Right now, the transmissions from Austar are FTA and no smart card is required. This could change at any time, is certain to change to smart-card-required no later than June 10. The current Austar channel line-up is shown below.

✓ **Austar holds a license** to serve non-metropolitan regions, Optus and Australis/Galaxy and Foxtel hold licenses to serve urban regions. Without a change in the Austar license by government, Austar cannot permanently serve the estimated 55,000 Australis/Galaxy satellite subscribers who live in urban areas. Austar claims to have "special temporary permission" to provide service to Galaxy's former urban subscribers while the legal problems sort out. Austar is telling people who live in urban areas to "call Foxtel or Optus" if they wish service and is giving no (telephone or press release) assurance to the former Galaxy served urban satellite subscribers they can continue to watch satellite programming beyond a non-specified (short term) date. If you contact Optus and Foxtel, they check your postal code to determine if you have cable TV available to your home. This is a fault-riddled method of checking since postal zone regions do not accurately reveal whether a home is within a cabled area or not. People who do have cable available, and who prefer a satellite service, are being told "*I am sorry - Austar cannot help you.*"

✓ **The assets of Galaxy** are being dismantled and sold. Austar and Optus, as noted, have formed a 50-50 joint venture and have acquired (to date - more could come shortly) the conditional access "system" used by Galaxy. This means that for a reported sum of A\$5,000,000, the two now own the rights to exclusively utilise the Irdeto CA system in Australia. Galaxy previously held this right under Irdeto license. The Pace DGT-400 IRDs used by Galaxy (and Austar) require the Irdeto system to function in a CA mode. Pointedly, any third party (such as Foxtel) which wants to operate under a co-operative CA format will have to deal with the Austar-Optus joint venture for rights to Irdeto CA.

✓ **Optus has attempted** to purchase "management rights" to handle the 55,000 previously Galaxy DTH subscribers; the financial receivers for Galaxy have turned down the offer saying it is not substantial enough. Optus in response has rebuked the Galaxy managers by stating, "*The technology which Galaxy has is 'old' and our own new technology is several generations newer, and better. What we have offered is all that it is worth.*"

In fact, the only technology of interest here is the Irdeto CA system, which separately Optus (with Austar) has acquired. Optus is playing another game as we shall see.

AUSTAR Channel Line-Up as of May 25

(1) Fox Sports, (2) Showtime, (3) Encore, (4) TV1, (5) Arena, (6) Channel [V], (7) Nickelodeon, (8) Discovery, (9) Fox Sport Two, (10) Lifestyle, (11) Comedy Channel, (12) World Movies, (13) Announcements/Preview channel, (14) CMT, (15) TNT/Cartoon Network, (16) BBC World, (17) TVSN, (18) CNBC

GALAXY FAILURE and SHUTDOWN - continued

What has happened to date is important only as it may reveal where all of this will end up. There are strong indications the following is either on the way to happening or is being tried (subject to regulatory and marketplace approval):

1) **Future DTH.** Austar has signed an agreement with both Optus and Foxtel to offer some of their channels within its own satellite DTH package. Austar with two transponders could handle as many as 22 programming channels (as did Galaxy before termination); any number beyond 22 will require a third transponder or increased compression (with a decrease in individual programme channel technical quality). Austar could end up with government approval to take over the left-stranded 55,000 Galaxy DTH subscribers. Another possibility is that Optus could use this group of subscribers to launch its own DTH service.

There are two other possibilities:

a) **Optus** could "manage" the ex-Galaxy subscribers while the actual technical service would come from Austar (Optus holds the correct urban license, Austar does not at this time);

b) **Foxtel.** An agreement to purchase 50,000 PACE IRD boxes has been negotiated and while the "cover story" claims these will be for use in the Foxtel cable TV service, there is no particular reason to believe this story. In fact, they could easily be for the launch of a Foxtel satellite service. Negotiations with PanAmSat for Ku band transponder space on PAS-8 have been conducted by Foxtel. The problem facing Foxtel is that PAS-8 will not be ready for service until late this year and leaving 55,000 Galaxy subscribers without service for up to 7 months would probably be a mistake. Foxtel sources admit "*We are looking at launching a DTH service.*"

2) **Not in isolation.** The Austar/Galaxy/Optus/Foxtel DTH scenario cannot be viewed in isolation. The carrier for all services at this point is the Optus B3 satellite. And all services are currently utilising the horizontal polarity of B3. There are technical reasons relating to the design limitations of B3 which make this necessary. Further, B3 has but 7 transponders which are capable of "national beam" coverage (numbers 9 through 15). There is a number crunch here.

a) **Simultaneous** to the "rationalisation" of pay TV in Australia, Optus is attempting to launch the digital RABS (rural area terrestrial broadcast TV) service which is replacing the B-MAC encrypted analogue delivery of the terrestrial services (ABC, SBS et al). As SatFACTS for May 15th urged, Optus is now determined to find a single horizontal transponder where the digital RABS service can be operated. Previously they had (perhaps through oversight or poor planning) intended to utilise a vertical transponder for the RABS digital service. By doing that, Optus creates a need for any RABS subscriber also wishing service from one of the DTH providers to install a user-cumbersome dual polarity LNB system. Technically, it makes far more sense to have all of the TV services (pay TV and RABS) on the same polarity of the same satellite.

b) **Of the seven** possible horizontal B3 transponders, set aside one for RABS. And consider the probability that RABS will require a second (also horizontal) transponder in the future. Now add two transponders for Austar's present needs and consider a third for an expanded Austar channel selection. At this point we have used a minimum of 3 and a maximum of 5 of the 7 available transponders. Now consider the needs for an Optus DTH service. From mid-March they were "testing" utilising two (full) transponders, and it is unlikely Optus DTH would occur using any fewer than 2 full transponders, with the probability they would require 3 rather than 2 to accommodate the programme channel selection they envision needing. Now we have a minimum of 5 and a maximum of 8 transponders. And there are but 7 to begin with.

None of this considers the possibility that Foxtel will launch a DTH service and might wish to be located on the same satellite utilising the same polarity as the competition (Optus as a minimum, possibly Austar as well). Which should begin to explain why Foxtel is talking with PanAmSat about PAS-8.

There is one more problem with B3, horizontal. Of the seven national beam, horizontal, transponders, one (#9) is leased to the Civil Aviation Authority of Australia. And it is the lifeline for all air traffic control communications. It is not actually available, and to make it available could require several years time (and a considerable expense).

GALAXY FAILURE and SHUTDOWN - continued

All of this may seem "terribly technical" and worthy only of high level engineering discussion. It is far more complex than merely an "engineering issue." If you cannot find a suitable method of delivering the proposed pay TV services, you have no business plan. Optus top management people are now discovering they cannot make "business decisions" isolated from the realities of the technical limitations of the delivery service.

The receivers are a key point in illustration.

✓ **Austar and Optus** have formed a joint partnership to "own" the rights to "exclusive use of the Irdeto conditional access (CA) system within Australia." This may seem like a technical issue; it is far more than that.

The ability to control channels is elementary to the business plan. Irdeto allows this to happen, and Galaxy had acquired the "exclusive Irdeto rights" when it began service. Late in January Optus negotiated an agreement to become a sub-licensee of Galaxy to allow use of Irdeto specifically for the RABS digital (terrestrial relay) service. That agreement did not grant Optus the right to utilise Irdeto for DTH pay TV in Australia.

When Galaxy went into receivership on May 5th there were instantly three separate "bids" to Irdeto for the right to become the "new" Irdeto "exclusive" in Australia. Bids ranged from A\$1,000,000 upwards and ultimately those rights went to the 50-50 partnership for a reported A\$5,000,000. This appears to grant Optus its first legal right to employ Irdeto in Australia for a DTH platform. Of note, Foxtel has no Irdeto rights at this time and in fact Fox parent News Corp has a competitive-to-Irdeto conditional access system of its own. It is the News Corp/NDS CA system which New Zealand Sky TV has purchased for their digital TV rollout late this year.

✓ Think of Irdeto as you would Windows 95; an "operating system." Think of an IRD as a computer (which in truth it is); an IBM computer. Windows 95 will operate in any IBM compatible computer, but it will not operate (in its IBM format) in a Macintosh computer. A Macintosh computer requires a separate "operating system."

The original receivers purchased by Galaxy were Pace model DGT-400s. They are Irdeto compatible. More recently, Optus has authorised the supply of South African UEC brand IRDs for the RABS digital terrestrial TV service and with Galaxy permission negotiated last January, the UEC (model 642) IRD is also Irdeto compatible. More recently, British based manufacturer Matsushita under their trade name Panasonic has also been approved by Optus to supply RABS digital receivers and they too are Irdeto equipped. Finally, Optus has been negotiating with Asian supplier Sun Moon Star (SMS) for a third IRD to also be Irdeto equipped and also for RABS.

The total number of RABS receivers required this year will not exceed 10,000. And this is barely a large enough market to support one IRD supplier, not to mention two or even three. Optus from the outset has planned for the day when Galaxy would "fall over" and Optus would be able to launch its own DTH service. The entire roll-out plan at Optus for satellite DTH has been predicated upon Galaxy going out of business.

✓ **Any receiver** (whether UEC, Panasonic or SMS) designed for the RABS project will have the complete Irdeto equipment and software required to function for an Optus pay TV platform as well. That has been the intention for more than 6 months. The first Irdeto equipped receivers must be utilised for the RABS project (which has fallen progressively further and further behind in start date because of the Optus DTH planning complications). Only after the RABS requirements are met will it be possible for Optus Vision to actually launch their own DTH service. So what is the status of the receiver supply lines today?

a) **Pace**. They originally supplied the Galaxy Irdeto-400 receivers. This model is believed to be out of production. A replacement version is in Australia for testing (ten units total) and is believed to be a candidate for Optus DTH rollout. Delivery in quantity? Not before September.

b) **Panasonic/Comstream**. Promising delivery of "first 1,000" before July 1st with "significant quantities" unlikely before September. There is a pricing problem as well and Matsushita would prefer to wait for a new, lower cost-to-produce model, later in the year.

c) **Sun Moon Star**. At least six weeks away from delivering first shipment (after July 1st). Hills Industries remains involved in this distribution and has "studied" an internal plan to do "final assembly" inside of Australia. In quantity? Unlikely before September.

GALAXY FAILURE and SHUTDOWN - conclusion

d) **UEC.** This South African firm was first through the gate to obtain Optus approval for RABS but there appear to be dangerous under currents. UEC delivered 40 model 642 receivers for RABS to appointed distributor Nationwide Antennas (Brisbane) early in May. Simultaneously, they delivered 40 model 642 receivers to Optus directly where the engineering department took them in tow. The 40 going to Optus are being utilised for ongoing testing of the RABS digital rollout on a formerly announced vertical transponder of B3.

There are problems. The 642 receivers received by Nationwide have been improperly loaded with incorrect default frequency settings and they have menu-operating difficulties. All of this is correctable. Possible problems at the UEC factory may not be so easily corrected, although the firm is promising delivery to Nationwide of 1,000 receivers before the middle of June. When they appear, this will be the actual roll-out start for the RABS programme.

Behind the scenes - at the London show May 20th, UEC, Pace, Comstream (and others) showed prototype single chip IRDs. Far fewer parts, automatic assembly, and best of all - pricing US\$60 below current 3 chip IRDs. Likely delivery - September. Is it any wonder there is foot dragging going on when IRDs for 20% less are just around the corner?

✓ **The RTIF Voucher Mess.** Someone at Optus has created a press release which complicates the deployment of RABS IRDs. The release explains that if the RABS consumer selects an UEC 642 IRD, they will be entitled to turn in their Australian government \$750 RTIF voucher as payment for the IRD. BUT - if they purchase a Panasonic/Comstream receiver, the RTIF voucher cannot be used.

This would appear to be a win for UEC and a loss for Panasonic. The \$750 government vouchers were designed to make the transition from B-MAC analogue to MPEG-2 digital as financially painless as possible for the "outback" viewers. Optus placed considerable pressure on IRD suppliers to price their products such that the \$750 voucher would either pay totally for or come very close to paying for the IRD changeout. Panasonic, no surprise here, feels betrayed that for whatever reason the public is being told the vouchers will not apply to their receivers. To Panasonic, this seems like a deliberate attempt to "favour" the UEC product. No explanation for this release at Optus has been obtained.

✓ **The RABS deadline.** Optus initially promised RABS conversion to digital in March. The next date was to be May, then June 1st. June 1st then became June 15th and now Optus tells us the RABS conversion to digital will not "begin" until July 16th and will not finish until October. Given the sorry state of RABS compatible IRD deliveries, it is quite easy to see how and why the original dates slipped. It is difficult to convert 10,000 sites if there are no receivers available for the conversion.

✓ **Bottom line on Australian DTH?** Increasingly, it looks as if Austar may have the only serious entry prior to October. How this will allow ex-Galaxy satellite subscribers to have continued service will remain a matter of negotiation between Optus, Austar and the ACCC. Optus could launch a service sooner but it lacks receivers to do so and probably transponder space as well. Austar, meanwhile, will be attempting to negotiate approval to serve urban viewers who have been left without service because of the Galaxy failure. Foxtel is the dark horse, and if Optus is delayed until October, the launch of PAS-8 late in the year might not turn out to be such a disadvantage after all.

There will be inequities no matter how it works out. MDS viewers are unlikely to get their services back unless an unknown firm comes along to take up the now mostly dormant transmitters. Viewers in urban areas previously receiving their pay TV via Galaxy satellite are in the greatest jeopardy where Perth, for example, had an estimated 2,000 Galaxy satellite subscribers. They cannot be reached by cable, and if Austar is not authorised to serve them, they will be out of luck.

Callers to Galaxy are being told they will receive refunds for any payments made after May 5th, and that between June 1 and 10th they will be notified what is to be done about the DTH and MDS equipment now in their homes. Until the fate of ex-Galaxy subscribers is determined, uncertainty and rumours rule the industry. The reality is while Galaxy may be dismantled quickly, the ashes will smoulder for months. See detailed report in SatFACTS June 15th.

